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MINIMUM DAILY NUMBER OF SUN-SPOT GROUPS.

| MONTHS. | 1890. | 1891. | 1892. | 1893. | 1894. | 1895. |
|--------------|-------|-------|-------|-------|-------|-------|
| January . . | | 0 | 2 | 2 | 4 | 3 |
| February . . | | 0 | 1 | 2 | 4 | 3 |
| March . . . | | 0 | 1 | 3 | 3 | 4 |
| April . . . | | 1 | 2 | 4 | 3 | 5 |
| May | | 2 | 4 | 6 | 3 | 1 |
| June | | 1 | 4 | 5 | 5 | 4 |
| July | | 2 | 3 | 4 | 4 | |
| August . . | 0 | 0 | 4 | 6 | 2 | |
| September . | 0 | 1 | 3 | 4 | 2 | |
| October . . | 0 | 3 | 2 | 5 | 2 | |
| November . | 0 | 2 | 3 | 4 | 3 | |
| December . | 0 | 1 | 2 | 2 | | |

ALTA, IOWA, October 9, 1895.

Latitude, $42^{\circ} 40' N.$ }
Longitude, 6h. 21m. W. }

DOUBLE-STAR MEASURES.

By R. G. AITKEN.

The following measures were made with the twelve-inch equatorial of this observatory. The position angle is usually the mean of four settings, and the distance that of three (occasionally four) double-distances. The position of the stars is given for 1880.0. The seeing is estimated by a scale on which 5 stands for the best conditions. The eye-piece used in most of the measures has a power of 545 diameters; but a few measures were made with lower powers.

Σ 13.

| | R. A. $0^h 9^m 25^s$. | Decl. $+76^{\circ} 17'$. | | |
|----------|------------------------|---------------------------|-------------|---------|
| | θ_0 | ρ_0 | MAGNITUDE. | SEEING. |
| 1895.664 | $81^{\circ}.7$ | $0''.73$ | 6.2 - - 6.2 | 4+ |
| 1895.681 | 84 .3 | 0 .81 | 6.2 - - 6.2 | 3+ |
| 1895.692 | 86 .4 | 0 .79 | 6.2 - - 6.3 | 3 |
| 1895.68 | $84^{\circ}.1$ | $0''.78$ | 6.2 - - 6.2 | |

Σ 60 (η Cassiopeiæ).

| | R. A. 0 ^h 41 ^m 51 ^s . | Decl. +57° 18'. | | |
|----------|--|-----------------|-------------|---------|
| | θ_0 | ρ_0 | MAGNITUDE. | SEEING. |
| 1895.664 | 203°.1 | 4''.96 | 4 - - - 7.8 | 4 |
| 1895.672 | 204 .1 | 5 .06 | 4 - - - 7.5 | 3+ |
| 1895.681 | 205 .1 | 4 .75 | 4 - - - 7.5 | 4+ |
| 1895.67 | 204°.1 | 4''.92 | 4 - - - 7.6 | |

 β 120 (ν Scorpii).

| | R. A. 16 ^h 5 ^m 1 ^s . | Decl. -19° 9'. | | |
|----------|---|----------------|-------------|----|
| | | A B. | | |
| 1895.462 | 0°.5 | 0''.88 | 6 - - - 6.5 | 3 |
| 1895.489 | 5 .2 | 0 .75 | 6 - - - 6.5 | 2+ |
| 1895.505 | 2 .7 | 0 .79 | 6 - - - 6.5 | 3+ |
| 1895.48 | 2°.8 | 0''.81 | 6 - - - 6.5 | |
| | | C D. | | |
| 1895.462 | 44°.2 | 1''.90 | 7.0 - - 8.5 | 3 |
| 1895.489 | 42 .7 | 1 .87 | 7.5 - - 8.5 | 2+ |
| 1895.500 | 40 .9 | 1 .90 | 7.0 - - 8.0 | 2+ |
| 1895.48 | 42°.6 | 1''.89 | 7.2 - - 8.3 | |

 β 624.

| | R. A. 16 ^h 15 ^m 41 ^s . | Decl. -22° 50'. | | |
|----------|---|-----------------|-------------|---|
| 1895.615 | 315°.4 | 1''.29 | 8 - - 9.2 | 4 |
| 1895.634 | 318 .5 | 1 .08 | 8.2 - - 9.8 | 4 |
| 1895.642 | 314 .3 | 1 .07 | 8.1 - - 9.8 | 3 |
| 1895.63 | 316°.1 | 1''.15 | 8.1 - - 9.6 | |

 β 241.

| | R. A. 16 ^h 48 ^m 24 ^s . | Decl. -21° 22'. | | |
|----------|---|-----------------|-------------|----|
| 1895.615 | 164°.9 | 0''.80 | 7 - - - 7.1 | 3+ |
| 1895.634 | 161 .3 | 0 .60 | 7 - - - 7.3 | 3+ |
| 1895.642 | 160 .1 | 0 .73 | 7 - - - 7.1 | 3 |
| 1895.63 | 162°.1 | 0''.71 | 7 - - - 7.2 | |

 β 357.

| | R. A. 16 ^h 59 ^m 52 ^s . | Decl. +10° 43'. | | |
|----------|---|-----------------|-------------|----|
| 1895.519 | 304°.3 | 1''.24 | 8.0 - - 9.3 | 3+ |
| 1895.527 | 299 .6 | 1 .38 | 8.3 - - 9.2 | 2+ |
| 1895.598 | 303 .5 | 1 .32 | 8.3 - - 9.4 | 3+ |
| 1895.55 | 302°.5 | 1''.31 | 8.2 - - 9.4 | |

β 823.

| | R. A. $17^h 0^m 29^s$. | Decl. $+0^\circ 49'$. | | SEEING. |
|----------|-------------------------|------------------------|-------------|---------|
| | θ_0 | ρ_0 | MAGNITUDE. | |
| 1895.634 | $6^\circ.0$ | $0''.77$ | 8.4 - - 9.3 | 3+ |
| 1895.642 | 4 .4 | 0 .99 | 8.1 - - 9.3 | 3 |
| 1895.738 | 8 .7 | 0 .79 | 8.3 - - 9.5 | 3+ |
| 1895.67 | $6^\circ.4$ | $0''.85$ | 8.3 - - 9.4 | |

E. E. B. No. ?.

| | R. A. $17^h 7^m 38^s$. | Decl. $-8^\circ 16'$. | | |
|----------|-------------------------|------------------------|------------|----|
| 1895.481 | $144^\circ.9$ | $2''.05$ | | 4 |
| 1895.519 | 147 .6 | 2 .12 | 7.8 - 12.0 | 4 |
| 1895.598 | 154 .1 | 2 .02 | 8.2 - 12.4 | 3+ |
| 1895.53 | $148^\circ.9$ | $2''.06$ | 8.0 - 12.2 | |

 Σ 2140 (*a Herculis*).

| | R. A. $17^h 9^m 10^s$. | Decl. $+14^\circ 32'$. | | |
|----------|-------------------------|-------------------------|-------------|---|
| 1895.462 | $115^\circ.3$ | $4''.77$ | 3.5 - - 6.0 | 3 |
| 1895.470 | 114 .0 | 4 .81 | | 4 |
| 1895.480 | 113 .5 | 4 .96 | 3.5 - - 6.0 | 4 |
| 1895.47 | $114^\circ.3$ | $4''.85$ | 3.5 - - 6.0 | |

 β 1121. (B. D. $+12^\circ 3264$.)

| | R. A. $17^h 31^m 52^s$. | Decl. $+12^\circ 37'$. | | |
|----------|--------------------------|-------------------------|-------------|----|
| 1895.634 | $235^\circ.6$ | $0''.56$ | 8.3 - - 9.5 | 3+ |
| 1895.681 | 236 .1 | 0 .70 | 8.5 - - 9.5 | 4+ |
| 1895.708 | 236 .2 | 0 .58 | 8.5 - - 9.5 | 3 |
| 1895.67 | $236^\circ.0$ | $0''.61$ | 8.4 - - 9.5 | |

A. C. 7.

| | R. A. $17^h 41^m 47^s$. | Decl. $+27^\circ 48'$. | | |
|----------|--------------------------|-------------------------|-----------|----|
| 1895.505 | $43^\circ.6$ | $1''.10$ | 10 - 10 | 3 |
| 1895.514 | 45 .3 | 1 .17 | 10 - 10.2 | 4 |
| 1895.708 | 43 .9 | 1 .14 | 10 - 10 | 3+ |
| 1895.58 | $44^\circ.3$ | $1''.14$ | 10 - 10.1 | |

 H_1 41.

| | R. A. $17^h 42^m 17^s$. | Decl. $+72^\circ 59'$. | | |
|----------|--------------------------|-------------------------|-------------|----|
| 1895.653 | $337^\circ.1$ | $1''.41$ | 7.8 - - 8.0 | 3 |
| 1895.672 | 337 .9 | 1 .43 | 7.8 - - 8.0 | 4+ |
| 1895.681 | 340 .1 | 1 .43 | 7.8 - - 8.0 | 4 |
| 1895.67 | $338^\circ.4$ | $1''.42$ | 7.8 - - 8.0 | |

Publications of the β 47.

| | R. A. $17^h 54^m 32^s$. | Decl. $-10^\circ 14'$. | | |
|----------|--------------------------|-------------------------|-------------------|--------|
| | θ_0 | ρ_0 | MAGNITUDE. | SEEING |
| 1895.615 | $278^\circ.0$ | $1''.57$ | 8.2 - 10.4 | 4+ |
| 1895.634 | 277 .5 | 1 .45 | 7.8 - 10.5 | 4 |
| 1895.642 | <u>275 .9</u> | <u>1 .38</u> | <u>8.0 - 10.4</u> | 3 |
| 1895.63 | $277^\circ.1$ | $1''.46$ | 8.0 - 10.4 | |

 β 283. (B. A. C. 6088.)

| | R. A. $17^h 54^m 38^s$. | Decl. $-22^\circ 47'$. | | |
|----------|--------------------------|-------------------------|-------------------|---|
| 1895.514 | $237^\circ.7$ | $8''.69$ | 6 - - - 13 | 4 |
| 1895.519 | 237 .1 | 8 .21 | 6.3 - - 13 | 4 |
| 1895.598 | <u>238 .2</u> | <u>8 .44</u> | <u>6 - - - 13</u> | 3 |
| 1895.54 | $237^\circ.7$ | $8''.45$ | 6.1 - - 13 | |

 β 1127. (Groombr. 2500.)

| | R. A. $17^h 58^m 59^s$. | Decl. $+44^\circ 13'$. | | |
|----------|--------------------------|-------------------------|-------------------|----|
| 1895.598 | $147^\circ.6$ | $0''.90$ | 8 - - 10.0 | 3 |
| 1895.615 | 146 .5 | 0 .90 | 8 - - 10.2 | 3+ |
| 1895.738 | <u>148 .2</u> | <u>0 .77</u> | <u>7.5 - 10.5</u> | 4 |
| 1895.65 | $147^\circ.4$ | $0''.86$ | 7.8 - 10.2 | |

 Σ 2272. (70 *Ophiuchi*.)

| | R. A. $17^h 59^m 23^s$. | Decl. $+2^\circ 33'$. | | |
|----------|--------------------------|------------------------|--------------------|---|
| 1895.481 | $300^\circ.6$ | $2''.43$ | 4 - - - 8 | 3 |
| 1895.681 | 298 .1 | 2 .29 | 3.5 - - 7.3 | 4 |
| 1895.692 | <u>298 .3</u> | <u>2 .26</u> | <u>3.5 - - 7.5</u> | 3 |
| 1895.62 | $299^\circ.0$ | $2''.33$ | 3.7 - - 7.6 | |

 β 132.

| | R. A. $18^h 4^m 7^s$. | Decl. $-19^\circ 52'$. | | |
|----------|------------------------|-------------------------|--------------------|----|
| 1895.514 | $222^\circ.6$ | $0''.83$ | 7 - - - 7.2 | 3+ |
| 1895.519 | 220 .5 | 0 .73 | 7 - - - 7.4 | 3+ |
| 1895.598 | <u>224 .0</u> | <u>0 .75</u> | <u>7 - - - 7.2</u> | 3 |
| 1895.54 | $222^\circ.4$ | $0''.77$ | 7 - - - 7.3 | |

β 465.

| | R. A. 18 ^h 41 ^m 38 ^s . | Decl. +56° 45'. | | |
|----------|---|-----------------|------------|---------|
| | θ_0 | ρ_0 | MAGNITUDE. | SEEING. |
| 1895.598 | 292°.1 | 3''.15 | 8 - - 10.1 | 3+ |
| 1895.609 | 291 .4 | 3 .20 | 8 - - 10.5 | 3 |
| 1895.730 | 294 .9 | 3 .04 | 8.3 - 10.5 | 3+ |
| 1895.64 | 292°.8 | 3''.13 | 8.1 - 10.4 | |

β 1135. (L. 39561.)

| | R. A. 20 ^h 25 ^m 10 ^s . | Decl. +45° 20'. | | |
|----------|---|-----------------|------------|----|
| 1895.749 | 338°.4 | 1''.34 | 8 - - 11.0 | 3 |
| 1895.768 | 333 .2 | 1 .22 | 8 - - 11.5 | 4+ |
| 1895.815 | 338 .7 | 1 .64 | 8.3 - 11.8 | 3 |
| 1895.78 | 336°.8 | 1''.40 | 8.1 - 11.4 | |

β 1036. (Yarn. 9529.)

| | R. A. 21 ^h 40 ^m 59 ^s . | Decl. -17° 51'. | | |
|----------|---|-----------------|------------|----|
| 1895.749 | 209°.8 | 4''.61 | 8 - - 11.5 | 3+ |
| 1895.790 | 209 .4 | 4 .68 | 8 - - 11.5 | 4 |
| 1895.815 | 208 .5 | 4 .82 | 8 - - 12.0 | 3 |
| 1895.78 | 209°.2 | 4''.70 | 8 - - 11.7 | |

Σ 3012-13.

| | R. A. 23 ^h 21 ^m 34 ^s . | Decl. +15° 58'. | | |
|----------|---|-----------------|-------------|----|
| A B. | | | | |
| 1895.768 | 267°.3 | 3''.05 | 7.8 - - 9.5 | 4+ |
| 1895.812 | 272 .1 | 2 .98 | 7.8 - - 9.3 | 4+ |
| 1895.815 | 270 .2 | 2 .67 | 7.8 - - 9.3 | 3 |
| 1895.80 | 269°.9 | 2''.90 | 7.8 - - 9.4 | |
| C D. | | | | |
| 1895.768 | 188°.4 | 2''.35 | 8.7 - - 8.8 | 4+ |
| 1895.812 | 191 .6 | 2 .54 | 8.7 - - 8.8 | 4+ |
| 1895.815 | 188 .0 | 2 .38 | 8.7 - - 8.8 | 3 |
| 1895.80 | 189°.3 | 2''.42 | 8.7 - - 8.8 | |
| A C. | | | | |
| 1895.768 | 243°.6 | 52''.54 | 7.8 - - 8.7 | 4+ |
| 1895.812 | 244 .5 | 53 .82 | 7.8 - - 8.7 | 4+ |
| 1895.815 | 244 .2 | 54 .31 | 7.8 - - 8.7 | 3 |
| 1895.80 | 244°.1 | 53''.56 | 7.8 - - 8.7 | |

Publications of the β 733. (85 Pegasi.)R. A. 23^h 55^m 52^s.

Decl. +26° 27'.

| | θ_0 | A B. ρ_0 | MAGNITUDE. | SEEING. |
|----------------|---------------|------------------|-------------------|---------|
| 1895.681 | 186°.2 | 0".73 | 5.5 - 12.0 | 4+ |
| 1895.692 | 188 .2 | 0 .88 | 5.6 - 11.5 | 2+ |
| 1895.702 | 185 .6 | 0 .86 | 5.6 - 12.0 | 2+ |
| 1895.708 | 184 .4 | 0 .91 | 5.5 - 12.0 | 3 |
| 1895.730 | 182 .4 | 0 .86 | 5.5 - 11.5 | 4 |
| 1895.738 | 188 .2 | 0 .91 | 5.5 - 11.5 | 4+ |
| <u>1895.71</u> | <u>185°.8</u> | <u>0".86</u> | <u>5.5 - 11.8</u> | |

A C.

| | | | | |
|----------------|---------------|---------------|--------------------|----|
| 1895.672 | 348°.3 | 29".27 | 5.5 - - 8.8 | 4+ |
| 1895.681 | 348 .6 | 29 .36 | 5.5 - - 8.6 | 4+ |
| 1895.692 | 349 .2 | 29 .17 | 5.6 - - 9.0 | 2+ |
| <u>1895.68</u> | <u>348°.7</u> | <u>29".27</u> | <u>5.5 - - 8.8</u> | |

 β 997. (L. 47215.)R. A. 23^h 58^m 46^s.

Decl. +45° 1'.

| | | | | |
|----------------|---------------|--------------|--------------------|----|
| 1895.681 | 337°.5 | 4".23 | 7.8 - - 8.8 | 4+ |
| 1895.692 | 340 .7 | 4 .06 | 8.0 - - 9.2 | 2+ |
| 1895.702 | 341 .1 | 4 .08 | 8.0 - - 9.2 | 2 |
| <u>1895.69</u> | <u>339°.8</u> | <u>4".12</u> | <u>7.9 - - 9.1</u> | |

O Σ 547.R. A. 23^h 59^m 12^s.

Decl. +45° 9'.

| | | | | |
|----------------|---------------|--------------|--------------------|----|
| 1895.672 | 124°.4 | 4".51 | 7.8 - - 7.8 | 4 |
| 1895.681 | 124 .2 | 4 .33 | 7.8 - - 7.8 | 4+ |
| 1895.692 | 124 .4 | 4 .29 | 8 - - 8 | 3 |
| <u>1895.68</u> | <u>124°.3</u> | <u>4".38</u> | <u>7.9 - - 7.9</u> | |

LICK OBSERVATORY, October 28, 1895.